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3

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DATE MAILED:

07/20/95

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

This application has been examined Responsive to communication filed on _____ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), _____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. Notice of References Cited by Examiner, PTO-892.
2. Notice of Draftsman's Patent Drawing Review, PTO-948.
3. Notice of Art Cited by Applicant, PTO-1449.
4. Notice of Informal Patent Application, PTO-152.
5. Information on How to Effect Drawing Changes, PTO-1474.
6. _____.

Part II SUMMARY OF ACTION

1. Claims 1, 7, 8, 10, 18, 19, 20, 22, 23, 29, and 35 are pending in the application.
Of the above, claims _____ are withdrawn from consideration.

2. Claims _____ have been cancelled.

3. Claims _____ are allowed.

4. Claims 1, 7, 8, 10, 18, 19, 20, 22, 23, 29, and 35 are rejected.

5. Claims _____ are objected to.

6. Claims _____ are subject to restriction or election requirement.

7. This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. Formal drawings are required in response to this Office action.

9. The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are acceptable; not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. The proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been approved by the examiner; disapproved by the examiner (see explanation).

11. The proposed drawing correction, filed _____ has been approved; disapproved (see explanation).

12. Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has been received not been received been filed in parent application, serial no. _____; filed on _____.

13. Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quigley, 1935 C.D. 11; 453 O.G. 213.

14. Other

EXAMINER'S ACTION

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.
2. The drawings are objected to because they do not include certain reference signs mentioned in the description. 37 CFR § 1.84 (p) states, "Reference signs not mentioned in the description shall not appear in the drawing and vice versa." The following reference signs are not included in the drawings:

The asymmetric cutout 42b of Figure 4B. Correction is required.

3. Applicant is required to submit a proposed drawing correction in response to this Office Action. Any proposal by the applicant for amendment of the drawings to cure defects must consist of two parts:

- a) A separate letter to the Draftsman in accordance with MPEP § 608.02(r); and
- b) A print or pen-and-ink sketch showing changes in *red ink* in accordance with MPEP § 608.02(v).

IMPORTANT NOTE: The filing of new formal drawings to correct the noted defect may be deferred until the application is allowed by the examiner, but the print or pen-and-ink sketch with proposed corrections shown in *red ink* is required in response to this Office Action, and *may not be deferred*.

4. The drawings are objected to under 37 C.F.R. § 1.83 (a). The drawings must show every feature of the invention specified in the claims. Therefore,

the beam splitter or dichroic mirror which **reflects light from the cantilever and sample to the optical microscope** of claim 8 and

the two separate mirrors used to scan in two separate directions of claims 22 and 23 must be shown or the features cancelled from the claims. No new matter should be entered.

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

6. The disclosure is objected to because of the following informalities:

Page 2, lines 16-17: The notation -- , now U.S. Patent No. 5,412,980 -- should be inserted after the application number designation.

Page 2, line 23: The notation "53(12), Sep. 19, 1988)" should be replaced with -- 65(1), 1 January 1989) --.

Page 4, line 13: The name "Mayer" should be replaced with -- Meyer --.

Page 4, line 15: The year "1989" should be replaced with -- 1991 --.

Page 9, line 23: The notation -- , now U.S. Patent No. 5,266,801 -- should be inserted after the application number designation.

Page 32, line 7: The "mounting member 48" should read -- mounting member 42 --.

Page 33, line 9: The second occurrence of "the" should be deleted.

Page 33, line 20: The notation -- , now U.S. Patent No. 5,266,801 -- should be inserted after the application number designation. Appropriate correction is required.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

8. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

9. Claims 1, 7, 18, and 29 are rejected under 35 U.S.C. § 102(a) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over Jung et al. The reference to Jung et al. discloses a scanning mechanism (P), a non-moveable light source (LS), a cantilever (CT) moved by the scanning mechanism, a stylus, a beam-tracking lens (L), and a position detector (PSD).

As to claim 7, the beam tracking lens acts as a functional equivalent to the applicant's steering lens.

As to claim 18, the reference discloses a collimated laser diode and the mounting for the lens is at least 70% of the distance from the fixed end of the scanning mechanism (P).

10. Claims 8 and 10 are rejected under 35 U.S.C. § 103 as being unpatentable over Jung et al. as applied to claim 1 above, and further in view of Okada et al.

As to claim 8, Jung et al. fail to disclose the use of an optical microscope and a beam splitter. The reference to Okada et al. discloses an atomic force microscope having a cantilever, photodiodes, a light source, a scanning mechanism, an optical microscope/eyepiece, a prism, and a beam splitter. Okada et al. use a prism to redirect reflected light from the cantilever and into the eyepiece. The examiner deems that this prism acts in a functionally equivalent manner to that of the applicant's mirror or beam splitter. It would have been obvious for one of ordinary skill in the art to have utilized an optical microscope and accompanying mirror or beam splitter so as ensure that light reflected from the cantilever reaches the microscope directly which would in turn allow the monitoring process to be seen much more clearly than if the light were received passively as disclosed in other prior art devices which utilize an optical microscope.

As to claim 10, the reference to Jung et al. fails to disclose a lens placed between the light source and the scanning mechanism. Okada et al. disclose focusing light through a lens directly after the light leaves its source. It would have been obvious for one of ordinary skill in the art to have provided a

lens mounted between the light source and the scanning mechanism so as to maintain a focused beam of light when the light arrives at the scanning means.

11. Claims 19 and 35 are rejected under 35 U.S.C. § 103 as being unpatentable over Jung et al. as applied to claim 1 above, and further in view of Dreyfus and Khoury et al. The reference to Jung et al. fails to disclose a fixed lens which "weakly" focuses light into a beam and then onto the steering lens. It would have been obvious for one of ordinary skill in the art to have provided a fixed lens for focusing the radiation from light source because Dreyfus (page 6, and Fig. 1) disclose a lens which passes light onto another lens which in turn focuses the light onto the sample. Dreyfus fails to disclose that the second lens is a steering lens. Khoury et al. disclose a scanning force microscope which utilizes beam steering optics comprising a steering lens in conjunction with a fixed lens. As to the placement of each lens, the examiner views this limitation as an obvious choice of design in view of the presumably valid patent to Khoury et al.

12. Claim 20 is rejected under 35 U.S.C. § 103 as being unpatentable over Jung et al. as applied to claim 1 above, and further in view of Buican et al. Jung et al. fail to disclose that the optical assembly is comprised of a mirror. Buican et al. disclose a mirror which is controlled by a scan driver for deflecting a laser over an image plane in the scanning of a specimen. Although the location of the mirror is not explicitly disclosed, it would have been obvious to have substituted the

mirror of Buican et al. with the lens of Jung et al. given that both devices are used in order to focus and direct light onto the backside of the cantilever.

13. Claims 22 and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Jung et al. as applied to claim 1 above, and further in view of Brelje et al. The reference to Jung et al. fails to disclose the use of two mirrors mounted to the scanning mechanism in order to allow scans in two different directions. Brelje et al. disclose an imaging systems having an X-Y scan means for scanning a specimen composed of two mirrors, one for each direction. It would have been obvious for one of ordinary skill in the art use two mirrors so as to provide greater flexibility to the microscope by allowing multi-directional scanning.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The prior art discloses various types of force microscope which utilize beam splitters and lens.

NOTE: The references to van der Werf et al., "Compact Stand-Alone Atomic Force Microscope", and Harp et al. (5,388,452) are not "prior art". The references are cited to show related art. Both references disclose mirrors located in the scanning mechanism.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Larkin whose telephone number is (703) 308-6724. The examiner can normally be reached on Monday-Friday from 7:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams, can

be reached on (703) 305-4705. The FAX telephone number for this Group (Group 2200 unit 2212) is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4900.

DL
Daniel Larkin

July 12, 1995

Hezron E. Williams
HEZRON E. WILLIAMS
SUPERVISORY PATENT EXAMINER
GROUP 2200